

Notice of Allowability

Application No.

09/633,002

Examiner

Wesley D. Markham

Applicant(s)

ISHIBASHI, KEIJI

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the after-final amendment dated 3/31/2005.
2. ☒ The allowed claim(s) is/are 27-32.
3. ☒ The drawings filed on 04 August 2000 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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DETAILED ACTION / ALLOWANCE

Response to Amendment

1. Acknowledgement is made of the after-final amendment filed by the applicant on 3/31/2005 (with a certificate of mailing dated 3/28/2005), in which the applicant proposed to cancel Claims 11 – 16 and 33. This amendment has been entered. **Claims 27 – 32** are currently pending in U.S. Application Serial No. 09/633,002, and an Office Action on the merits follows.

Drawings

2. The formal drawings (2 sheets, 3 figures) filed on 8/4/2000 are approved by the examiner.

Allowable Subject Matter

3. Claims 27 – 32 are allowed.
4. The following is an examiner's statement of reasons for allowance: Independent Claim 27, from which Claims 28 – 32 depend, requires removing a deposited film from a wall inside a chamber by heating a platinum-containing hot element, the hot element disposed away from the wall and the deposited film, to a temperature of 400° C or higher without generating a plasma, supplying the chamber with a cleaning gas containing at least one of a fluorine atom and a chlorine atom and first contacting the hot element with the gas to activate the gas, thereafter contacting the deposited film with the activated cleaning gas and converting the film into a gaseous

substance, and removing the gaseous substance from the chamber. A summary of the closest prior art of record follows. Yamanaka et al. (USPN 6,592,771) teaches a method for etching a film on a substrate located in a vacuum apparatus, the vacuum apparatus having a chamber, the method comprising providing a hot element "46" in the chamber, the hot element disposed away from the deposited film and having at least a surface which comprises platinum, placing the substrate in the chamber, exhausting the chamber, heating the hot element to 400° C or higher, supplying into the chamber a cleaning gas containing at least one of a fluorine atom and a chlorine atom, contacting the cleaning gas with the heated hot element to decompose and/or activate the cleaning gas and generate an activated species therefrom, and allowing the activated species to etch the deposited film on the substrate. Muranaka et al. (USPN 6,410,454) similarly teaches removing contaminants on the surface of a semiconductor wafer by activating a halogen-containing gas with a heated filament made of platinum and then contacting the activated cleaning gas with the surface of the wafer. However, both of the above cited references are drawn to etching / cleaning a substrate, not removing a deposited film from a wall inside a chamber, as required by the applicant's claims. In fact, the chamber wall cleaning process taught by Yamanaka et al. uses a fluorine-based gas plasma, not hot element activation without the generation of a plasma as required by the claims. As such, neither reference, alone or in any reasonable combination, teaches or suggests performing the applicant's claimed method. Bluck et al. (USPN 6,101,972) teaches a method for removing a deposited film from a wall inside a chamber, the method comprising

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providing a "hot element" (i.e., filaments "32" and "42") in the chamber, the hot element disposed away from the wall of the chamber and the deposited film, exhausting the chamber, heating the hot element, supplying a cleaning gas into the chamber and first contacting the hot element with the gas to thereby activate the gas, and contacting the deposited film with the activated cleaning gas to clean the walls of the chamber. However, Bluck et al. does not teach that the filaments are composed of platinum, as required by the claims. Additionally, Bluck et al. clearly teaches and desires forming a plasma while heating the hot element in the chamber in order to perform the CVD and chamber cleaning processes (see the entire Bluck et al. reference, including the title). Therefore, Bluck et al., alone or in combination, does not teach or reasonably suggest heating the hot element without generating a plasma in the context of the applicant's claims. For the above reasons, the prior art of record, alone or in combination, does not teach or reasonably suggest each and every limitation of independent Claim 27, and this claim is allowed. Claims 28 – 32 depend from Claim 27 and are therefore also allowed.

5. As set forth in paragraph 13 of the previous Office Action (i.e., the final Office Action mailed on 12/30/2004), the examiner again notes that, in allowing Claims 27 – 32, the "wall inside a chamber" from which the deposited film is removed, as required by the claims, has been interpreted to be any of the inside walls of the chamber (see, for example, page 8, lines 28 – 30, and page 9, lines 16 – 19, of the specification, which support the examiner's interpretation of the claims). Therefore, etching / removing a deposited film from the "walls" of a substrate inside the chamber (e.g.,

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the walls of a trench in a semiconductor substrate or device) would not be encompassed by the applicant's claims.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D. Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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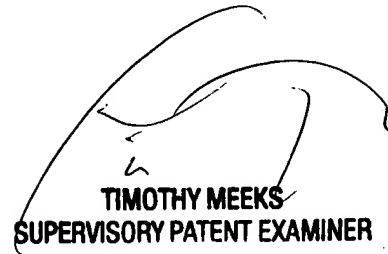
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Wesley D Markham

Examiner

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TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER